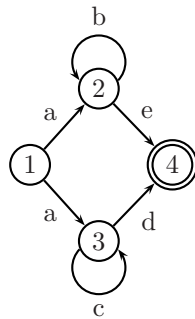


1 Objectives

- Be able to explain the problem of parsing.
- Know how to recognize a word using an NFA or a DFA.
- Know the difference between a DFA and an NFA
- Be able to convert a NFA into a DFA
- Vocabulary to know: deterministic, nondeterministic, lexing, scanning, accept state, transition.
- Know the syntax of regular expressions.
- Know how to convert between regular expressions and state machines.
- Know the limitations of regular languages.

For further reading see the Dragon Book, §3.1 and 3.6.

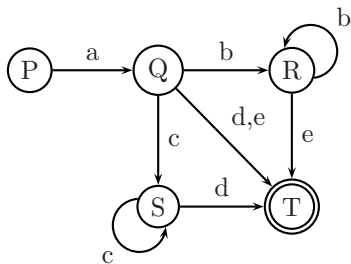
2 Examples



3 Problems

Try the following problems. In a few minutes the instructor will go over the solutions. Feel free to work with the person next to you!

Convert the following NFA to a DFA.



(More problems on the back!)

Write a regular expression for the following kinds of words

- hexadecimal numbers
- numbers in scientific notation
- file names ending in .C
- numbers between 0 and 255

Describe in English the following regular expressions

- `[a-zA-Z][a-zA-Z0-9]+`
- `[a-z]*(es|ed|ing)`
- `<[a-z0-9]+@[a-z0-9]+(\.[a-z0-9]+)+>`

Which of the following can be described by regular expressions?

- All the words in the English language
- All the Fibonacci numbers
- “All Your Base Are Belong To Us” video
- Numbers that are multiples of 4 (assume ≥ 2 digits)
- Words that have exactly as many as as they have bs
- Pallindromes